

Disease Surveillance and Investigation Branch

DISEASE SURVEILLANCE REPORT

Northern Ireland Disease Surveillance Report, October to December 2017

- *Mycoplasma bovis* infection in cattle
- Fungal rumenitis in young calves
- Fasciolosis in sheep
- Larval paramphistomosis in sheep
- Ionophore toxicity in turkeys

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for October to December 2017

CATTLE:

Respiratory diseases

Respiratory disease was identified in 99 cattle post mortem submissions between October and December 2017. The most common pathogens identified included *Mycoplasma bovis* (thirty six cases), *Mannheimia haemolytica* (seventeen cases), *Pasteurella multocida* (fifteen cases), *Trueperella pyogenes* (nine cases), BRSV (eight cases), *Histophilus somni* (seven cases) and parasitic pneumonia including disease in adult animals (six cases).

Broncho interstitial pneumonia, a significant feature of which was the presence of syncytia in the alveolar walls was detected on histological examination of the lung from a young calf from a group being fed indoors on milk, concentrates and haylage. Bovine respiratory syncytial virus (BRSV) was demonstrated in association with the lesions by immunofluorescence.

'Honker's syndrome is a condition of unknown aetiology, characterised by extensive oedema of the tracheal mucosa and submucosa. A seven-month-old heifer which had shown marked stridor and dyspnoea before collapsing whilst being put into a crush was submitted for necropsy. There was submucosal haemorrhage and focal submucosal necrosis affecting the trachea. These changes had resulted in considerable narrowing of the tracheal lumen and were considered similar to some of the changes described in tracheal oedema and haemorrhage syndrome (honker syndrome) of feedlot cattle. While the aetiology of the condition is unknown it is speculated the effort of coughing and negative intra-tracheal pressures during inspiration may be involved. The history given in this case indicated the animal collapsed on being put into a cattle crush so it was noted that traumatic injury should also be considered.

Alimentary diseases

Neonatal enteritis

The pathogens identified in neonatal bovine faecal samples during the quarter are shown in TABLE 1. (Next page) Overall, *Cryptosporidium* species and Rotavirus were the most common pathogens identified.

TABLE 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, October to December 2017

Pathogen	Number	
	Tested	Positive (per cent)
<i>Cryptosporidium</i> species	256	97 (37.9%)
Rotavirus	258	83 (32.2%)
Coronavirus	260	19 (7.3%)
<i>Escherichia coli</i> K99	166	8 (4.8%)

Numerous instances of enteritis and associated septicaemia in neonatal and young calves were investigated during the reporting period. A common factor was the insufficient uptake of colostral antibodies as demonstrated by low (<10.0 units) ZST results. Two specific instances of fungal rumenitis were investigated and in one of these cases an extended spectrum beta-lactamase (ESBL) producing *E. coli* was recovered from alimentary and systemic cultures. It was suggested that over-use of antimicrobials was likely in this instance and was predisposing to the fungal infection and the presence of an ESBL strain.

In one specific case, intestinal obstruction appeared to have been caused by the possible over-use of a mucopolysaccharide or non-digestible gel anti-diarrhoeal product which had formed a hard dry plug in the lower jejunum. BVDV nucleic acid was detected by RT-PCR in this case. *E.coli* was recovered in septicaemic distribution and once again this was shown to be an ESBL strain.

Septicaemia (navel ill / joint ill) was frequently present in association with poor colostral absorption on units with enteric problems and a typical picture was of a dark and congested carcass, swollen navel with fibrin exudation, joint ill and in some cases suppurative meningo-encephalitis (FIGURE 1).

**Figure 1**

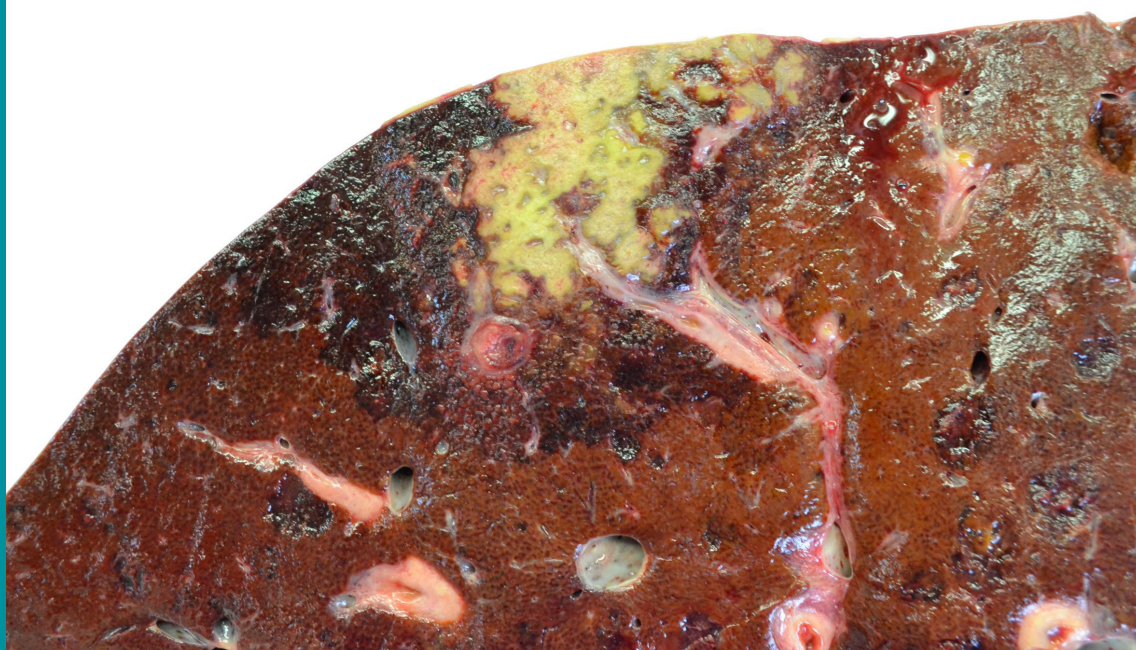
Suppurative meningo-encephalitis in a calf with colisepticaemia

Black disease in a cow

Black disease was diagnosed in an unvaccinated twelve-year-old cow which was dull and inappetent for three- to four days. Typical lesions were present in the liver (FIGURE 2) (Next Page)

Figure 2

Black disease lesion in the liver of a cow



Emaciation

Malnutrition was considered to be the possible cause of death in a six-month-old calf which showed very poor condition, non-existent fat supplies and serous atrophy of the renal and coronary fat. Intercurrent infectious disease was ruled out on the basis of routine testing and advice was given to thoroughly check the quality and quantity of forage being offered.

Other enteric conditions

Parasitic ova found in ruminant faeces samples submitted during the period are shown in TABLE 2.

TABLE 2: Endoparasitic infections in ruminants in Northern Ireland, October to December 2017

	Total	No of parasitic ova					% positive
		Negative	+	++	+++	++++	
Liver fluke							
Bovine	835	764	59	11	1	0	8.5%
Ovine	468	419	20	18	4	7	10.5%
Paramphistome							
Bovine	834	336	126	230	62	80	59.7%
Ovine	468	259	72	96	25	16	44.7%
Coccidia							
Bovine	900	616	265	10	4	5	31.5%
Ovine	472	117	321	25	4	5	75.2%
Strongyle worm egg count							
	Total	<500 epg	≥500 epg				% Positive
Bovine	899	862	37				4.1%
Ovine	472	354	118				25.0%

≥500 eggs per gram of faeces (epg) was considered of likely clinical significance
+ Low, ++ Moderate, +++ High, ++++ Very high

Johne's disease

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 155 bovine faecal samples. 36 samples (23.2 per cent) contained acid-fast organisms typical of MAP. Of 4313 bovine blood samples that were tested for antibodies to MAP 294, (6.8 per cent) were positive.

Nutritional and metabolic disease

Lead poisoning

Lead toxicity was confirmed in a two-year-old heifer on detection of 109.9 µg/g lead in the kidney. The heifer presented with nervous signs and died within eight hours despite treatment with antimicrobials and anti-inflammatory drugs (for suspected listerial encephalitis). Further animals presented with acute nervous signs and a total of eight animals died in this small suckler herd. Food Standards Agency – Northern Ireland were informed of the incident. Pit silage was considered to be a possible source of the contamination.

Reproductive and mammary diseases

Abortion

Specimens from 121 bovine abortions and stillbirths were examined during the 4th quarter. Significant pathogens were detected in 47 cases (38.8 per cent). Of these, *T. pyogenes* (11 cases, 9.1 per cent) was the most commonly identified pathogen. Other pathogens identified included *Bacillus licheniformis* (9 cases, 7.4 per cent), *Neospora caninum* (7 cases, 5.8 per cent), *Salmonella* Dublin (6 cases, 5.0 per cent), BVDV (4 cases, 3.3 per cent) and *E. coli* (4 cases, 3.3 per cent).

Summary of bovine abortion in Northern Ireland 2017

CHART 1 below gives a summary of the causes of bovine abortion diagnosed in Northern Ireland during the period January to December 2017.

Bovine Abortion Data 2017

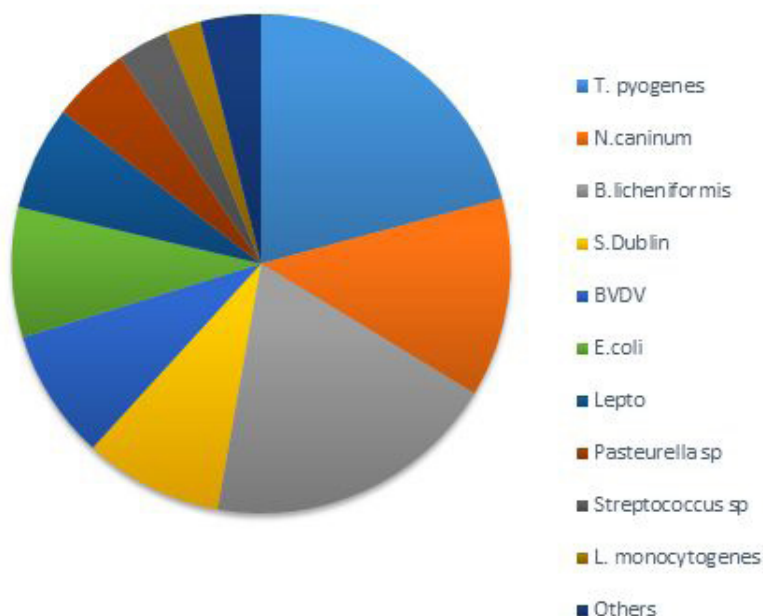


Chart 1

Summary of the causes of bovine abortion diagnosed in Northern Ireland during 2017

Specimens from 435 bovine abortions and stillbirths were examined during 2017. Significant pathogens were detected in 178 cases (40.9 %). Of these, *T. pyogenes* (37 cases, 8.5 %) was the most commonly identified pathogen. Other pathogens identified included *B. licheniformis* (34 cases 7.8%), *N. caninum* (23 cases, 5.3 %), *S. Dublin* (16 cases, 3.7 %), *E. coli* (15 cases, 3.4 %) and BVDV (15 cases, 3.4 %).

Other reproductive diseases

Mastitis

A total of 385 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. 40 (10.4 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 61 samples. *E. coli* was the most frequently isolated organism and accounted for 18.2 per cent of isolates cultured. Other frequently identified organisms included, *Staphylococcus aureus* (7.5 per cent), *Streptococcus uberis* (5.7 per cent) and *Streptococcus dysgalactiae* (4.2 per cent)

Neurological diseases

Clostridium botulinum type D toxicosis was not diagnosed in any cases during the 4th quarter of 2017.

Other diseases of cattle

Mycoplasma bovis infection in cattle

Disease due to *Myc. bovis* infection was diagnosed in calves and cows in several herds during the reporting period with both arthritis and pneumonia being present in the same calf in two instances. Full post mortem examination including histology, immunohistochemistry to localise mycoplasmal antigen in suspicious lesions and RT-PCR to detect nucleic acid were all used in the diagnosis.

Endocarditis of the pulmonary valve, with septic pulmonary embolism leading to pneumonia and emphysema was diagnosed in a five-year-old dairy cow presented with a history of scouring. There was septic arthritis affecting multiple limb joints. *Myc. bovis* nucleic acid was detected by RT-PCR and *T. pyogenes* was recovered from the pneumonic lung and from septic joint material.

Physical trauma in a bull

A one-year-old bull died after showing tachypnoea. At necropsy uroperitoneum was detected from a ruptured bladder. There was fracture of the caudal sacrum, from which a large haematoma extended along the pelvic canal adjacent to the neck of the bladder and the urethra. It was considered that the haematoma from the sacral fracture prevented the bladder from voiding urine thereby causing rupture.

SMALL RUMINANTS: SHEEP

Respiratory diseases

Respiratory disease was identified in 14 ovine post mortem submissions during this quarter. Jaagsiekte (five cases), pasteurellosis (four cases) and parasitic pneumonia (one case) were the most common diagnoses. Cases of Jaagsiekte continued throughout the reporting period and secondary pasteurellosis was a feature of some cases. It was noted that the affected sheep frequently showed higher than expected faecal egg counts, not representative of the flock as a whole and this is often seen in sheep debilitated by Jaagsiekte.

Alimentary diseases

Johne's disease

Five ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. Two samples (40.0 per cent) contained acid-fast organisms typical of MAP. 26 ovine bloods samples were tested for antibodies to MAP during this quarter, all of which were negative.

Fasciolosis

Fasciolosis was commonly diagnosed in sheep flocks during the latter part of the reporting period as was expected on the basis of the AFBI liver fluke forecast for the autumn / winter 2017 / 18. Acute, sub-acute and chronic disease was seen indicating that infection was being picked up off the pasture even quite late in the year. Some affected flocks had been treated but re-infection had taken place; in other instances an inappropriate product, with insufficient activity against immature forms had been used.

Larval paramphistomosis

Parasitic gastro enteritis, nematodirosis and larval paramphistomosis was diagnosed in an eight month old lamb with severe diarrhoea. There were significant levels of *Nematodirus battus* (6,500) and very high numbers of immature paramphistomes (34,000) in the small intestine and 800 *Ostertagia circumcincta* were observed microscopically in the abomasum.

Reproductive diseases

Abortion

Specimens from 17 ovine abortions and stillbirths were examined during the 4th quarter of 2017. The pathogens identified were *Toxoplasma gondii* (3 cases, 17.6 per cent), *Chlamydophila abortus* (2 cases, 11.8 per cent) and *Listeria monocytogenes* (1 case, 5.9 per cent).

Summary of ovine abortion in Northern Ireland 2017

Ovine Abortion Data 2017

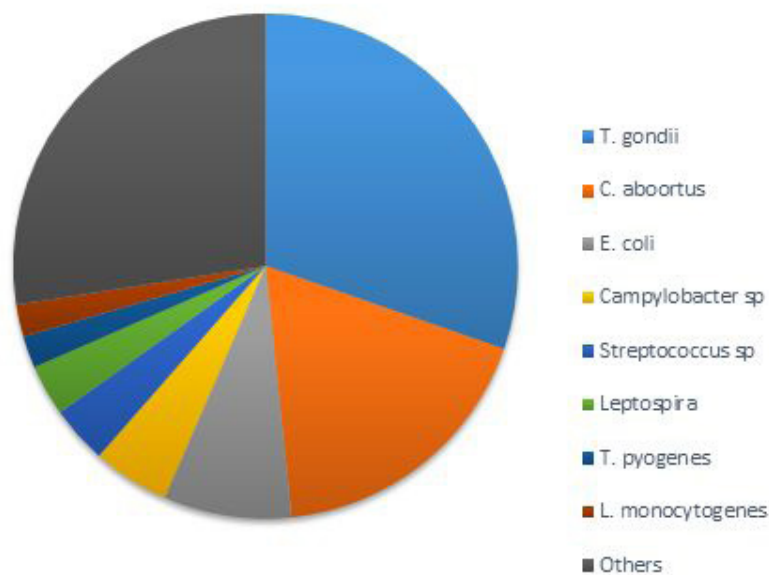


Chart 2

Summary of the causes of ovine abortion diagnosed in Northern Ireland during 2017

Specimens from 244 ovine abortions and stillbirths were examined during 2017. Significant pathogens were detected in 165 cases (67.6 %). Pathogens identified included *T. gondii* (74 cases, 30.3 %), *C. abortus* (44 cases, 18.0 %), *E. coli* (20 cases, 8.2 %), *T. pyogenes* (5 cases, 2.0%) and *Listeria monocytogenes* (5 cases, 2.0 %).

Neurological diseases

One case of listerial encephalitis was confirmed by post mortem examination during the 4th quarter of 2017.

Urinary tract disease

Urethral obstruction due to penile trauma was diagnosed on post mortem examination of a ram. There was marked urine retention in the bladder and the pelvis of each kidney was swollen with fluid. There was in addition severe sub capsular haemorrhage and oedema in both kidneys. There was no evidence of urolithiasis.

Skin diseases

No cases were examined for sheep scab during the 4th quarter of 2017.

Other diseases

Clostridial enterotoxaemia (pulpy kidney) was diagnosed in two seven-month-old lambs. Both lambs died suddenly. There was hydropericardium containing large gelatinous clots in both lambs and coning of the cerebellum in one lamb. Histologically microangiopathy was present in the brain of both. *Cl. perfringens* epsilon toxin was detected in the small intestinal content of both lambs. The flock had not been vaccinated against clostridial disease.

HORSES:

4 swabs were examined for the presence of *Tayorella equigenitalis* during this quarter, all were negative. 14 swabs were cultured from horses with a history suggestive of strangles during this quarter, one swab was positive.

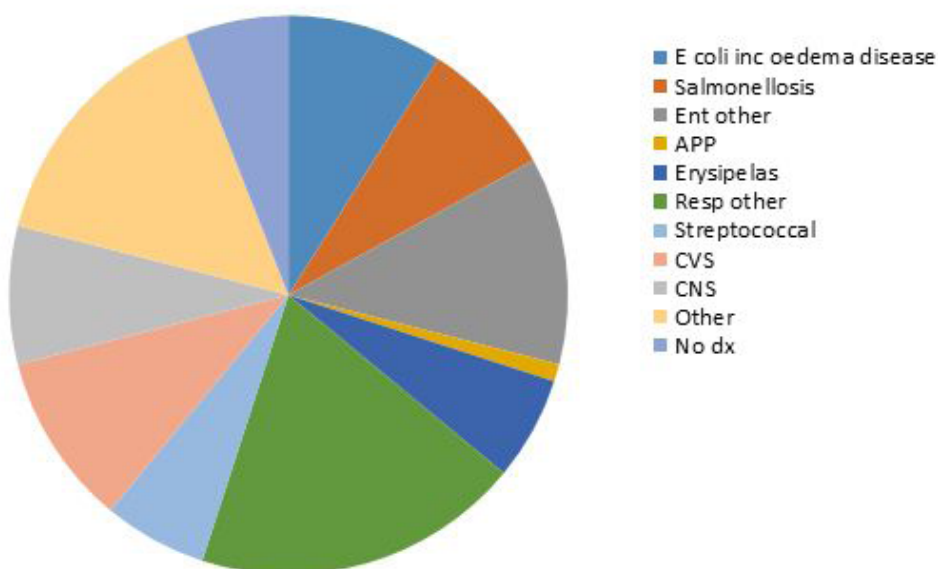
Clostridial myositis

Clostridial myositis was diagnosed in a three-year-old horse with a massive, malodorous oedematous swelling of the head. Histological examination showed oedema, haemorrhage, mild acute interstitial myositis and myofibrillar necrosis. These lesions were considered suggestive of clostridial myositis and profuse growths of *Clostridium perfringens* were recovered from affected tissue.

PIGS:

The post mortem diagnostic summary for pigs of between one and five months of age during 2017 is given in CHART 3 below.

**PIGS OF 1 to 5 MONTHS DIAGNOSTIC ANALYSIS
2017**

**Chart 3**

The post mortem diagnostic summary for pigs between 1 & 5 months during 2017

E. coli infection including post weaning diarrhoea and oedema disease (thirteen cases, 9.0%), salmonellosis (twelve cases, 8.0%) and erysipelas disease (eight cases, 6.0%) were amongst the most common conditions.

***Klebsiella pneumonia* septicaemia in piglets**

Septicaemia due to *K. pneumonia* infection was diagnosed in four-week-old piglets from a unit experiencing a high rate of sudden death amongst young pigs. At necropsy there were fibrin strands present in the abdomen. The liver was dark. There was excess amber thoracic effusion and moderate hydropericardium. There were fibrin strands within the thoracic cavity. *K. pneumonia* was recovered in pure culture in septicaemic distribution.

BIRDS: Poultry

The diagnostic analysis for poultry post mortem submissions during the quarter is given in CHART 5 (next page).

Liver disease including fatty liver (ten cases, 21.0%), musculo-skeletal disorders including tendonitis and tendon rupture (nine cases, 19.0%) and parasitic disease (four cases, 8.0%) predominated.

POULTRY SUBMISSION DIAGNOSTIC ANALYSIS Q4 2017

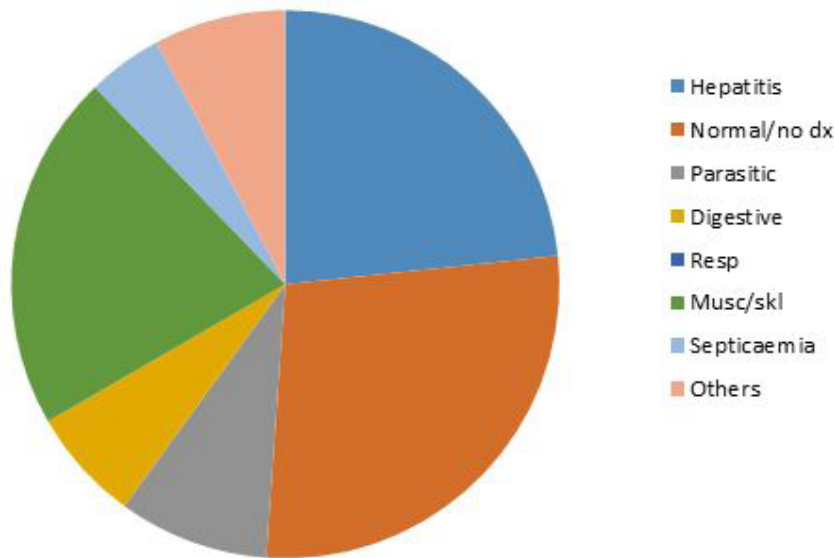


Chart 4

The diagnostic analysis for poultry post mortem submissions during quarter 4 of 2017

Ionophore toxicity in turkeys

High mortality was seen in a rearing turkey flock shortly before Christmas with 60 out of three hundred birds dying and around 50 more showing respiratory signs. Avian influenza matrix testing was negative. Gross findings and histopathology were suggestive of ionophore toxicity. In the heart and skeletal muscle there was fractionation and shortening of the myofibrils which were swollen and eosinophilic. The changes were most marked in the skeletal muscle but in neither case was there evidence of substantial cellular infiltration. Further investigation revealed that the flock had been fed left-over broiler diet containing the salinomycin derivative Narasin. Narasin is known to be toxic to turkeys.

Fowl cholera in chickens

Carcases were submitted from a free range poultry unit showing a mortality and morbidity rate of around 3%. On gross examination the carcasses were congested and dehydrated with excess fluid and fibrin strands present in the body cavities. There was mild yolk peritonitis, enlargement of the livers and spleens and fibrinous pericarditis. The tracheas were slightly congested. Testing for HPAI, PMV-1 and ILT was concluded with negative results. *Pasteurella multocida* was recovered in profuse growth from lung and systemic cultures.